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Running head: CALLOUS UNEMOTIONAL TRAITS AND AGGRESION

Callous-Unemotional Traits and their Implication for Understanding and Treating Aggressive
and Violent Youths

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Abstract

This paper reviews the current research literature on the development of aggression and callous-unemotional traits. Research suggests there are two functions to aggression, reactive and instrumental, and each has concomitant cognitive and emotional factors associated. Further, callous-unemotional (CU) traits (i.e., an absence of empathy and guilt) have been shown to be associated with the instrumental type of aggression. Research on CU traits suggests that there are distinct developmental mechanisms operating in the development of aggressive and violent behavior for youths with and without these traits. These distinct developmental mechanisms have important implications for the assessment and treatment of aggressive and violent youths.

Key words: Callous-unemotional traits; reactive aggression; instrumental aggression; violence.

Callous-Unemotional Traits and their Implication for Understanding and Treating Aggressive and Violent Youths

Aggressive behavior, in which others are intentionally harmed, is one form of antisocial behavior (Frick, et al., 1992). Given that aggressive behavior often precedes and/or co-occurs with delinquent behavior (Broidy, et al., 2003), it is of great importance for understanding juvenile violent criminal behavior and for managing youths in the juvenile justice system (Office of Juvenile Justice and Delinquency Prevention, 1995). Research has been converging on the usefulness of a number of different types of dispositions or traits that could be very important for understanding the different causal pathways that can lead to aggressive behavior. In this manuscript, we review evidence for one type of disposition, callous-unemotional (CU) traits, that recent research has suggested may be particularly promising for understanding aggressive and violent youths. Further, we discuss how this available research can be used to inform treatments for aggressive juvenile justice involved youths.

Callous-unemotional traits and aggression

In adult samples, the construct of psychopathy has proven to designate a particularly violent and chronic subgroup of antisocial individuals. Specifically, only a small proportion of adult offenders show the affective (e.g., callousness, lack of guilt and empathy; poverty of emotion), interpersonal (e.g., grandiosity, manipulativeness), and behavioral (e.g., impulsivity, irresponsibility) features that define psychopathy. However, those with these traits exhibit a more severe, violent, and chronic pattern of antisocial behavior (Leistico, Salekin, DeCoster, & Rogers, 2008).

Importantly, several recent qualitative (Frick & Dickens, 2006; Frick & White, 2008) and quantitative (Edens, Campbell, & Weir, 2007; Leistico, et al., 2008) reviews have been published showing that psychopathic traits in general, and the affective or callous-

unemotional (CU) dimension specifically, are also predictive of a more severe, stable, and aggressive pattern of behavior in antisocial youth. For example, Edens et al. (2007) conducted a quantitative meta-analysis of 21 non-overlapping samples of offenders showing that psychopathy measures, which include CU traits, were associated with general or violent recidivism with effect sizes of $r=.24$ and $r=.25$, respectively. Frick and Dickens (2006) reviewed 24 published studies using samples covering early childhood to early adulthood. They showed that CU traits were associated with more severe conduct problems, delinquency, and aggression. Ten of these studies were cross-sectional studies, largely focusing on forensic samples, demonstrating contemporaneous associations between CU traits and antisocial behavior. An additional 12 studies were longitudinal, including both forensic and community samples, demonstrating predictive relations between these two constructs. Further, they reviewed five published studies showing an association between CU traits and poor treatment outcome, again largely from inpatient forensic samples. While these studies were weighted towards adolescent samples and tended to have limited follow-up periods (e.g., 1 to 2 years), the review did include studies with samples as young as age 3 (Kimonis, et al., 2006) and with follow-up periods as long as 10 years (Gretton, Hare, & Catchpole, 2004). Not included in this review were 12 additional concurrent studies with clinical, forensic, and community samples, showing the association between CU traits and severity of conduct problems (Dadds, Whiting, & Hawes, 2006), violence and aggression (Barry, et al., 2007; Dolan & Rennie, 2006a; Enebrink, Anderson, & Langstrom, 2005; Fite, Stoppelbein, & Greening, 2009; Skeem & Cauffman, 2003; Vitacco, Neumann, Caldwell, Leistico, & Van Rybroek, 2006), bullying (Fanti, Frick, & Georgiou, 2009; Muñoz, Qualter, & Padgett, 2010; Viding, Simmonds, Petrides, & Frederickson, 2009), and delinquency (Dolan & Rennie, 2006b; Loeber, et al., 2005; Poythress, Dembo, Wareham, & Greenbaum, 2006). Also, four longitudinal studies show the predictive relationships between CU traits

and later antisocial personality (Loeber, Burke, & Lahey, 2002), violence and aggression (Ridenour, Marchant, & Dean, 2001) and delinquency (Lynam, et al., 2009; Pardini, Obradovic, & Loeber, 2006).

Taken together, this body of research provides quite compelling evidence that CU traits are associated with a particularly severe pattern of antisocial behavior. However, much of this research has focused on CU traits and their association with antisocial behavior in general, for which aggression is just one component. That is, in terms of their association specifically with aggression, CU traits seems to designate a subgroup of antisocial youth who show more severe aggression and who is more likely to show both instrumental (e.g., for gain) and reactive (e.g., in response to perceived provocation) aggression (Enebrink, et al., 2005; Fanti, et al., 2009; Fite, et al., 2009; Frick, Cornell, Barry, Bodin, & Dane, 2003; Kruh, Frick, & Clements, 2005). For example, in a sample of incarcerated juvenile offenders (ages 16-21), Kruh et al. (2005) identified two subtypes of violent offenders. The first group was high on CU traits and committed high rates of both instrumental and reactive violence, and also committed violence that led to more severe harm to their victims. In contrast, the group lower on CU traits committed only reactive violence and the violence led to less severe harm to their victims. Similarly, in a sample of 150 detained adolescent sex offenders, high levels of CU traits were associated with greater number of victims, more violence committed in the sexual offense, and more premeditation and planning in the sexual offense (Lawing, Frick, & Cruise, 2010). This link between CU traits and more severe, premeditated, and instrumental aggression is not limited to offender samples. In a school-based sample of children, those children with both conduct problems and CU traits showed higher levels of instrumental and reactive forms of aggression, whereas children with conduct problems alone showed less severe aggression and only reactive forms of aggression (Frick, Cornell, Barry, et al., 2003). Finally, in a psychiatric sample of 105 children, caregiver reports of CU traits were related to

instrumental and reactive forms of aggression, while self-reports were related only to instrumental aggression (Fite, et al., 2009). Thus, in different samples and in different age cohorts, CU traits have been related to a particularly severe type of aggression that involves both instrumental and reactive forms of aggression which results in more severe harm to the victims.

Cognitive and emotional correlates to aggression.

Importantly, there has been a significant amount of research indicating several important differences in the emotional and cognitive correlates to the different types of aggression (e.g., Dodge & Pettit, 2003; Frick, 2001). Reactive aggression is characterized by impulsive defensive responses to a perceived provocation or threat (Dodge & Coie, 1987; Eisenberg & Fabes, 1992). It is characterized by “hot blooded,” angry, and hostile responses, whereby an overreaction to minor or perceived provocation and intense physiological reactivity are often exhibited (Dodge & Coie, 1987; Dodge, Lochman, Harnish, Bates, & Pettit, 1997; Hubbard, et al., 2002). One of the reasons why children may respond with such reactive aggression may be a failure in the cognitive processing of social information at myriad levels of decision-making (Dodge, et al., 1997; Dodge & Pettit, 2003; Lemerise & Arsenio, 2000; Stickle, Kirkpatrick, & Brush, 2009). Children who show high levels of reactive aggression may (1) selectively attend to negative social cues, (2) fail to consider other explanations for negative events, (3) fail to consider alternative responses other than aggressive ones, and (4) fail to consider the consequences of their actions.

Unlike reactive aggression, instrumental aggression is not typically associated with provocation (Dodge, et al., 1997). The social information processing deficits associated with instrumental aggression are different from those associated with reactive aggression. Children who engage in instrumental aggression tend to (1) value aggression as an effective means of acquiring their desired goals more than do other children, and (2) they anticipate positive

outcomes for their aggressive behavior (Dodge, et al., 1997). These children are overly focused on the outcome of their aggressive acts and view aggression as an effective problem-solving strategy that will aid them in obtaining their goals (Marsee & Frick, 2010).

Instrumental aggression also differs from reactive aggression in its prognosis for antisocial outcomes. Specifically, instrumental aggression rated during preadolescence predicts delinquency, delinquency-related violence, and disruptive behaviors during mid-adolescence (Brendgen, Vitaro, Tremblay, & Lavoie, 2003; Vitaro, Brendgen, & Tremblay, 2002; Vitaro, Gendreau, Tremblay, & Oligny, 1998). In addition, studies with community samples show instrumental aggression at age 14 predicts criminal behavior (Pulkkinen, 1996) and psychopathic traits (Fite, Raine, Stouthamer-Loeber, Loeber, & Pardini, 2010) in adulthood. In contrast, reactive aggression does not have such strong utility for predicting later delinquency (Pulkkinen, 1996; Vitaro, et al., 2002; Vitaro, et al., 1998). For example, Vitaro and colleagues (2002) found that individuals who only acted aggressively in response to provocation were less likely to engage in delinquent acts as adolescents. Instead of delinquency-related violence, these children were more likely to engage in dating violence (Brendgen, et al., 2003).

As suggested by these findings, different emotion and emotion regulation processes may contribute to the development and expression of reactive and instrumental aggression (see Lemerise & Arsenio, 2000). In further support of this contention, in a study of 2nd grade students, children who exhibited reactive aggression also showed the sharpest increase in nonverbal angry behaviors (such as throwing materials) throughout a competitive game played with a peer (Hubbard, et al., 2002). In contrast, children rated high in instrumental aggression actually were less emotionally reactive than those rated low in instrumental aggression (Hubbard, et al., 2002). Similar results were reported by Muñoz, Frick, Kimonis, and Aucoin (2008a) in a study of 85 adolescent boys (ages 13-18) in a juvenile detention

center. In this study, the boys played a competitive computer task against a hypothetical peer who provided low and high levels of provocation. Youth high on both self-reported reactive and instrumental aggression showed different behavioral responses to provocation than youth high on only reactive aggression. Specifically, the combined group showed high levels of aggressive responses without any provocation, whereas the group high on reactive aggression showed an increase in aggressive responding only to low provocation. Importantly, the results revealed a trend for the combined group to show lower levels of skin conductance reactivity to low provocation. However, this was only the case if they were also high on CU traits. This finding suggests that some of the emotional characteristics that have been attributed to youths with instrumental aggression may actually be more specifically associated with CU traits.

Taken together, this research suggests that children and adolescents who show reactive forms of aggression and those who also show instrumental forms of aggression seem to show very different emotional and cognitive characteristics. Further, CU traits are differentially related to the various patterns of aggressive behavior and may account for some of these emotional and cognitive differences.

Cognitive and emotional correlates to callous-unemotional traits

Children and adolescents with CU traits evidence a social information-processing style that appears to be similar to the style that has been associated with instrumental aggression (Pardini, Lochman, & Frick, 2003). Specifically, studies have documented that antisocial youth with CU traits are less sensitive to punishment cues, especially when a reward response set is primed (Fisher & Blair, 1998; O'Brien & Frick, 1996; Pardini, et al., 2003). Also, in forensic samples, adolescents with CU traits showed a tendency to show more positive outcome expectancies in aggressive situations with peers (Pardini, et al., 2003), and are more likely to value aggression as a suitable strategy to deal with problems (Stickle,

et al., 2009). However, antisocial youths with CU traits are less likely to show other types of social information processing deficits. That is, they appear to be less likely to show hostile attributional biases (Frick, Cornell, Bodin, et al., 2003; Stickle, et al., 2009) and they show more flexibility in information processing (Waschbusch, Walsh, Andrade, King, & Carrey, 2007) than antisocial youth without these traits. Importantly, although youths with CU traits share cognitions and information processing biases with youths who are aggressive, it appears these expectancies do not solely account for the high levels of aggression exhibited by youths with CU traits. In a sample of 150 detained youth (ages 11-17), CU traits showed a direct effect on aggression and social information processing factors did not fully mediate the relationship (Stickle, et al., 2009).

Besides deficits in social cognition, aggressive and antisocial youth often also show deficits in their overall intelligence and especially in verbal intelligence (Cornell & Wilson, 1992; Leech, Day, Richardson, & Goldschmidt, 2003; Moffitt & Henry, 1991; Stattin & Magnusson, 1995; Vermeiren, De Clippele, Schwab-Stone, Ruchkin, & Deboutte, 2002). Again, however, this association may depend on the presence of CU traits. For example, antisocial youth with CU traits are less likely to show verbal deficits than other antisocial youth in both clinic (Loney, Frick, Ellis, & McCoy, 1998) and forensic (Muñoz, Frick, Kimonis, & Aucoin, 2008b; Salekin, Neumann, Leistico, & Zalot, 2004) samples. Further, in an adolescent (13 to 18 years of age) sample of 100 detained boys, lower verbal ability was associated with more violent delinquency in those without CU traits, whereas higher verbal ability was associated with more violent delinquency in those high on CU traits (Muñoz, Frick, et al., 2008b). Thus, the association between verbal ability and aggression may be somewhat dependent on whether or not the child or adolescent shows high levels of CU traits.

There is also evidence to suggest that children and adolescents with CU traits have problems in several types of emotional processing (see Frick and White, 2008 and Marsh &

Blair, 2008 for reviews). For example, children with CU traits have been shown to be less emotionally responsive to fearful and sad facial expressions (Blair, Colledge, Murray, & Mitchell, 2001; Dadds, El Masry, Wimalaweera, & Guastella, 2008; Dadds, Perry, et al., 2006; Leist & Dadds, 2009), sad vocal inflections (Stevens, Charman, & Blair, 2001), fearful body postures (Muñoz, 2009) and pictures of persons and animals in distress (Kimonis, Frick, Fazekas, & Loney, 2006; Kimonis, Frick, Munoz, & Aucoin, 2008). These studies have generally shown that CU traits are related to a deficit in the child's affective experience of empathic concern to the distress in others. This possibility has been supported by several studies showing a negative association between CU traits and measures of empathy in both community (Muñoz, et al., 2010) and forensic (Kimonis, Frick, Skeem, et al., 2008; Pardini, et al., 2003) samples.

Importantly, developmental research has made a distinction between the affective experience of concern to the distress of others (i.e., affective empathy) and the ability to recognize the emotions of others (i.e., cognitive empathy). The findings reviewed above suggest that children and adolescents with CU traits show deficits in affective empathy. However, the findings for cognitive empathy are less clear and this may be due to developmental changes in empathy deficits. For example, Dadds et al. (2009) reported that in a community sample of boys, CU traits were related to deficits in both affective and cognitive empathy at ages 3-8 years. However, in older boys (12 years old), the deficits with affective empathy remained, whereas the association with cognitive empathy was no longer found. Thus, by early adolescence, the boys with CU traits appeared to have developed an understanding of the affective meaning of emotional cues, despite lacking the shared emotional experience that is associated with affective empathy. Dadds and colleagues (2009) described this change over development as learning to 'talk the talk' of emotions.

In an at-risk sample, Loney, Frick Clements, Ellis and Kerlin (2003) reported findings consistent with this developmental change in cognitive empathy in a sample of 60 adolescent boys (ages 12-18) with criminal involvement who were referred to a day treatment program. Importantly, rather than using self-reports of empathy, these authors used an emotional lexical decision paradigm in which participants were required to indicate whether or not a string of letters formed a real word. The response speed to recognizing words of emotional and non-emotional content were compared. They reported that CU traits were negatively associated with the speed of processing words of negative emotional content relative to neutral words, indicating less facilitation in their speed of recognition to these words. However, there was no association between level of CU traits and the youths' ratings of the emotional content of the words, suggesting that the emotional deficits were largely confined to the degree of reactivity to the negative emotional words; the emotional deficits were not apparent in the youths' recognition of the emotional content of words. Thus, these findings suggest that, unlike other problems that can lead to empathy deficits such as autism, older children and adolescents with CU traits seem to show adequate emotional understanding and are not impaired in their cognitive understanding of emotions (Jones, Happé, Gilbert, Burnett, & Viding, 2010).

Finally, CU traits tend to be positively correlated with measures of fearless or thrill seeking behaviors (Essau, Sasagawa, & Frick, 2006; Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Pardini, et al., 2006; Sadeh, Verona, Javdani, & Olson, 2009) and negatively correlated with measures of trait anxiety or neuroticism (Andershed, Gustafson, Kerr, & Stattin, 2002; Frick, et al., 1999; Hipwell, et al., 2007; Lynam, et al., 2005; Pardini, Lochman, & Powell, 2007), at least in community or clinical samples. Importantly, the negative correlation between measures of CU traits and trait anxiety/neuroticism are generally only found after controlling for the level of conduct problems (Frick, et al., 1999;

Lynam, et al., 2005). That is, children with CU traits tend to show less trait anxiety *given the same level of conduct problems*. This pattern of results suggest that children with CU traits are less distressed by the consequences of their behavior problems on themselves and others compared to youth with comparable levels of conduct problems (Frick, et al., 1999; Pardini, et al., 2003).

Callous-unemotional traits and developmental models of aggression

Thus, the available research suggests that CU traits are associated with a particularly severe pattern of aggression and they are associated with several emotional and cognitive characteristics that are often linked to aggressive behavior. Importantly, these traits can provide one method for integrating these findings into a theoretical model to explain the development of the different forms of aggressive behavior. Specifically, the low fear and lack of sensitivity to punishment cues relate to a temperamental style that has been variously labeled as “low fearfulness” or a “lack of behavioral inhibition” (Rothbart & Bates, 1998). This temperament has been linked to lower scores on measures of conscience development in young children, in both concurrent (Asendorpf & Nunner-Winkler, 1992; Kochanska, Gross, Lin, & Nichols, 2002) and prospective (Rothbart, Ahadi, & Hershey, 1994) studies. This association is found when temperament is measured using behavioral measures of fearful inhibitions (e.g., avoidance of novel, strange, or threatening stimuli) and when measured using psychophysiological indexes of reactivity to threatening stimuli (Fowles & Kochanska, 2000). Importantly, there have been several developmental theories to account for this link.

Some developmental theorists have suggested that moral socialization and the internalization of parental and societal norms are partly dependent on the negative arousal evoked by potential punishment for misbehavior (Kochanska, 1993). Guilt and anxiety associated with actual or anticipated wrongdoing can be impaired, if the child has a

temperament in which the negative arousal to cues of punishment is attenuated, resulting in a diminished experience of this transgression-related anxiety (Dadds & Salmon, 2003). Also, such negative arousal may be critical in the development of empathic concern, whereby negative emotional reactivity to the distress of others becomes conditioned to the behaviors, on the part of the child, that resulted in the distress of others (Blair, 1995). Because this process involves avoidance learning based on experienced negative arousal to the distress in others, a temperament characterized by a deficit in both of these processes could make the development of empathy more difficult.

These deficits in empathy, guilt, and other aspects of conscience development can then make the child more likely to act aggressively (Jolliffe & Farrington, 2006). Thus, this model suggests that a fearless temperament may place a developing child at risk for failures in conscience development and CU traits, which make the child more likely to act in an aggressive manner. In support of this model, Pardini et al. (2006) reported that, in a sample of detained adolescent offenders, the associations of measures of fearlessness and punishment insensitivity with violent delinquency were mediated by the youth's level of CU traits.

Importantly, this developmental model does not specify what causes the child to have a fearless temperament and it is possible that this can be due to either genetic predispositions (Viding, Blair, Moffitt, & Plomin, 2005; Viding, Jones, Frick, Moffitt, & Plomin, 2008) or through traumatic environmental experiences (Kimonis, Frick, Muñoz, & Aucoin, 2008). Further, two studies using functional brain imaging reported that the emotional deficits related to CU traits may be related to amygdala hyporeactivity to others' distress (Jones, Laurens, Herba, Barker, & Viding, 2009; Marsh, et al., 2008). Both of these studies employed an implicit emotion processing task (gender recognition) and found amygdala hyporeactivity to fearful faces in antisocial youth with CU traits. Another study documented an abnormal ventromedial prefrontal cortex response to punishment in children

with CU traits (Finger, et al., 2008). This study employed a task in which the participants had to learn that a stimulus that used to be rewarded was subsequently associated with loss and that they should stop responding to that stimulus. These results are consistent with previously reviewed findings showing abnormalities in how youth with CU traits respond to reward and punishment contingencies.

Another important consideration in the developmental model linking temperamental deficits in emotional responding to CU traits and aggression is the fact that such a pathway is not likely to be immutable. That is, one of the important reasons for proposing such a pathway is that it could lead to tests of protective factors that can help children who may be at risk for CU traits and aggression due to a certain temperamental factor, leading to optimal development for these youths. To illustrate this possibility, Cornell and Frick (2007) studied preschool children (3-5 years of age) nominated by their teachers as being highly fearful or highly fearless and they found two interactions between these temperaments and certain parenting behaviors in predicting measures of empathy and guilt. Specifically, they reported an interaction with parental consistency in discipline, such that children who were fearful showed higher levels of guilt, irrespective of the consistency of parenting. However, fearless children showed higher levels of guilt only when parental consistency was high. The second interaction was with authoritarian parenting (i.e., use of strong rule-oriented and obedience-oriented parenting), such that authoritarian parenting was unrelated to parent ratings of guilt in fearful children but positively related to levels of guilt in fearless children. The authors interpreted these findings to suggest that fearful children were predisposed to develop appropriate levels of guilt and often do so, even with less than optimal parenting. However, fearless children require stronger and more consistent parenting to develop appropriate levels of guilt.

Thus, these findings suggest that certain types of parenting can deflect children who are on the pathway from fearless temperament to problems in conscience development. There is also evidence to suggest that even once a child develops significant levels of CU traits, a large number of these youth show decreases in these traits over time. That is, there are now numerous studies showing that CU traits are relatively stable from late childhood to early adolescence, both when assessed by self-report (Muñoz & Frick, 2007) or by parent report (Frick, Kimonis, Dandreaux, & Farrell, 2003; Obradović, Pardini, Long, & Loeber, 2007). For example, the stability of parent ratings of CU traits was estimated at $ICC = 0.71$ across 4 years in a high-risk sample of children (mean age 10.65 at initial assessment (Frick, Kimonis, et al., 2003) and was estimated at $r = 0.50$ across 9 years in a sample of inner city boys (Obradović, et al., 2007). There is also evidence to suggest that CU traits are relatively stable ($r = 0.60$) from age 17 years into early adulthood (age 24 years; Blonigen, Hicks, Krueger, Patrick, & Iacono, 2006) and relatively stable ($ICC = 0.40$) over 6 years from ages 16 to 18 years to ages 22 to 24 years (Loney, Taylor, Butler, & Iacono, 2007). Finally, two studies have shown that measures of CU traits assessed in childhood are significantly associated with measures of psychopathy in adulthood, even controlling for childhood conduct problems and other risk factors for antisocial behavior (Burke, Loeber, & Lahey, 2007; Loney, et al., 2007).

However, these studies suggest that although the stability of CU traits is similar to what is typically found for other personality traits in children and adolescents (Roberts & DelVecchio, 2000), they are not unchangeable. To illustrate this, Lynam et al. (2007) reported that CU traits in childhood was correlated with an adult measure of psychopathy 11 years later at a level of $r = 0.31$. Further, youths at age 13 who were in the upper 10% of CU traits at age 13 were 3.22 times more likely to show elevations on a measure of psychopathy 11 years later. However, only 21% of the boys who scored in the upper 10% on the measure

of CU traits at age 13 years were elevated on measures of psychopathy at age 24 years. Thus, a large number of boys seemed to show reductions in their rate of CU traits over development (see also Frick, Kimonis, et al., 2003 for a similar pattern of change).

Studies in community samples suggest these reductions in CU traits over time may be due to factors either in the child's family (Frick, Kimonis, et al., 2003) or peer group (Muñoz, Kerr, & Besic, 2008). To illustrate the potential role of family factors, Frick, Kimonis, et al. (2003) reported that the stability CU traits over a four year period was related the quality of parenting the child experienced. To illustrate the potential role of peer factors, Muñoz, Kerr et al. (2008) found a high rate of antisocial behavior and violence in a group of adolescents with a high and stable rate of CU traits. However, the kind of friend these youths had moderated this effect. Those high in CU traits decreased in delinquency over time if they nominated a friend that they met in school as compared to those who nominated a friend made in the neighborhood or someplace out of the school environment.

Importantly, our developmental model linking fearlessness to CU traits and aggression also helps in understanding children without CU traits who develop aggression. That is, given the many different types of emotional and cognitive characteristics in the two groups, it is likely that there are different causal processes that lead to the aggressive behavior in children without CU traits (Frick & Morris, 2004). Specifically, in children and adolescents without CU traits, there is a strong association between ineffective parenting practices and their antisocial behavior (see Frick & White, 2008 for a review), including when studied in detained samples of adolescents (Edens, Skopp, & Cahill, 2008). Thus, it is possible that children and adolescents in this group are not socialized adequately and, as a result, do not learn to appropriately regulate their behavior in response to environmental contingencies (Kochanska, et al., 2002).

Another consistent finding for antisocial youth without CU traits is that they often

have problems regulating their emotions. That is, children in this group appear to show a temperament characterized by strong emotional reactivity, a deficit in the skills needed to adequately regulate their emotional reactivity, or both (Frick & Morris, 2004). These problems in emotional regulation can result in the child committing impulsive and unplanned aggressive and antisocial acts for which he or she may be remorseful afterwards but may still have difficulty controlling in the future (Pardini, Lochman, & Wells, 2004). Such problems in regulating emotion would also explain the findings that the aggressive behavior displayed by this group tends to be confined to reactive forms of aggression (Frick, Cornell, Barry, et al., 2003; Kruh, et al., 2005).

Assessment Implications

Based on this research, the presence of CU traits seems to designate an important subgroup of aggressive youth. As a result, such traits would be important to assess in samples who have a high rate of aggression and violence, such as institutionalized adolescents. From the existing research, a number of methods have emerged for assessing the core features of psychopathic traits in youths, including CU traits, with appropriate developmental modification and with varied response formats. There have been several recent reviews of these assessment methods with comprehensive discussions of their strengths and weaknesses and guidelines for their use in forensic assessments (Kotler & McMahon, 2010; Sharp & Kine, 2008; Vincent, 2006). Thus, we only provide a brief summary of these methods here and in Table 1.

Most of the assessment measures were based primarily on the Psychopathy Checklist-Revised (PCL-R; Hare, 1991), which is considered the ‘gold standard’ for assessing psychopathy in adults. The most direct extension of the PCL-R is the *PCL-Youth Version* (PCL-YV; Forth, Kosson, & Hare, 2003). The 20-item PCL-YV was designed to assess psychopathy traits using an interview and a review of official records, similar to the format

employed by the PCL-R. Because the PCL-YV does not rely solely on self-report and because it requires a review of official records, it is most often used in the assessment of juvenile justice involved adolescents in institutions (Vincent, 2006). However, this assessment format requires completion by highly trained raters. It has generally been used with samples from ages 13 to 18 years and contains a normative sample of over 2000 predominantly white boys in forensic institutions (Forth et al., 2003). Factor analyses of the PCL-YV have consistently identified four facets labeled interpersonal features, deficient affect, impulsive lifestyle and antisocial behavior (Cooke & Michie, 2001; Neumann, Kosson, Forth, & Hare, 2006). Importantly, the deficient affect facet, which is the dimension consisting of CU traits includes only 4 items. Tests of the PCL-YV's reliability has shown adequate interrater and internal consistency and an ability to predict antisocial and aggressive behavior (Forth, Hart, & Hare, 1990; see also Kotler & McMahon, 2010).

The *Antisocial Process Screening Device* (APSD; Frick & Hare, 2001) is one of the most widely used assessment of CU traits in research with children and adolescents. It was derived from the items of the PCL-R but making modifications so that the items are more developmentally appropriate for children and adolescents and to be more appropriate for use in both forensic and community samples. It is a 20-item rating scale with versions for teacher-, parent-, and self-report. It has been used with samples from ages 4 to 18 years. The self-report version of the APSD has been the version used most consistently in samples of incarcerated adolescents (Vincent, 2006). In samples of incarcerated adolescents, factor analyses have consistently identified three personality dimensions corresponding to similar factors found for the PCL-YV, with the exception of the antisocial behavior dimension (Vitacco, Rogers, & Neumann, 2003). Importantly, the self-report version also shows relatively high levels of stability (Muñoz & Frick, 2007) and scores on this version have been associated with severity of antisocial and aggressive behavior (Frick & Dickens, 2006) and

with specific cognitive and emotional deficits described previously (Frick & White, 2008). Like the PCL-YV, however, the APSD has a very limited assessment of CU traits (6 items) and, as a result, this dimension has shown relatively low internal consistency in many adolescent samples (Loney, et al., 2003; Poythress, Douglas, et al., 2006).

Similar to the APSD, the Child Psychopathy Scale (Lynam, 1997) is rationally derived to have content similar to the PCL-R. However, the items used to derive this measure were limited to items taken from the Child Behavior Checklist (Achenbach, 1991) and the California Child Q-Set (Block & Block, 1980). The CPS contains 41 items and has both caregiver-report and self-report forms. Factor analysis of the CPS in a high risk community sample revealed two factors (i.e., an affective-interpersonal factor and an impulsive/antisocial behavior factor; Lynam, et al., 2005). As a result, there is no separate CU dimension that can be derived from this scale. The scale has shown acceptable levels of internal consistency and has been associated with measures of delinquent behavior (Lynam, 1997). Importantly, scores on the CPS at age 13 have been shown to predict adult psychopathy at age 24 years (Lynam, et al., 2007).

The *Youth Psychopathic Traits Inventory* (Andershed, Kerr, Stattin, & Levander, 2002) includes 50 items and was designed for use with youths 12 years-old and older. Ten scales can be collapsed into three subscales; Callous-unemotional, Impulsive/ Irresponsible, and Grandiose/ Manipulative. The self-report items were written in an attempt to reduce a socially desirable response set, so that people high in psychopathic traits could read the statements as reflecting positive or admirable qualities. For example, YPI items include “I think that crying is a sign of weakness, even if no one sees you” and “when other people have problems, it is often their own fault; therefore, one should not help them”. Although the reliability and validity of this scale has not been as extensively tested as other measures of psychopathy, its scales have generally shown adequate internal consistency. Also, scores on

the YPI were related to institutional infractions in a sample of adolescent offenders (Skeem & Cauffman, 2003).

All three of the scales reviewed above were designed to assess CU traits as one component of a broader dimension of psychopathy. Thus, the coverage of CU traits tends to be fairly limited on these scales. The *Inventory of Callous-Unemotional Traits* (ICU; Frick, 2004) was developed to provide a more extended assessment (e.g., 24 items) specifically of CU traits. The ICU scales have self-report, parent-report, and teacher report versions. The factor structure of the self-report version has been tested in a community sample (n=1443) of German adolescents ages 12 to 18 (Essau, et al., 2006), a school-based sample (n=347) of Greek Cypriot adolescents ages 12 to 18 (Fanti, et al., 2009), a school-based sample (n=455) of adolescents ages 14 to 20 in Flanders, Belgium (Roose, Bijttebier, Decoene, Claes, & Frick, 2010), and a moderate sized (n=248) sample of juvenile offenders ages 12 to 20 in the United States (Kimonis, Frick, Skeem, et al., 2008). In all four samples using different translations of the scale, a similar factor structure emerged with three factors (e.g., Uncaring, Callousness, Unemotional) loading on a higher-order CU dimension providing the best fit. Importantly, the total scores proved to be internally consistent in these samples (coefficient alpha .77 to .89) and they were related to antisocial behavior, aggression, delinquency, various personality dimensions, and psychophysiological measures of emotional reactivity in ways consistent with past research on CU traits.

Much of the work with ICU has been conducted with the self-report format, especially in adolescent and institutionalized samples (e.g., Lawing, et al., 2010). However, Roose et al. (2010) showed that the factor structure of the parent and teacher versions of the ICU was similar to the self-report version in their community sample of adolescents. Further, White, Cruise, and Frick (2010) used both the parent and self-report versions of the scale in a study of incarcerated adolescent sex offenders (n= 94). In this sample, both parent-report and self-

report of CU traits were significantly related to higher general delinquency risk scores, with parent-report showing somewhat stronger correlations than self-report. Both parent-report and self-report were related to sex-offending specific risk factors, with parent-report significantly correlated with static sexual offending risk factors and self-report significantly correlated with dynamic sexual-offending risk factors. Thus, the ICU could be a promising multi-informant method for providing a more extended assessment of CU traits in various samples of children and adolescents, including incarcerated adolescents.

Treatment implications

There are also a number of implications of this research on CU traits for prevention and treatment (Frick, 2006; Frick & White, 2008). First, by focusing on developmental pathways and by focusing on the developmental mechanisms that may have gone awry in different subgroups of aggressive youth, this research can help to designate important targets of preventive interventions. For example, interventions in communities can focus on enhancing development, such as promoting the development of empathy (Chi-Ming, Greenberg, & Walls, 2003) or the development of emotional regulation (Larson & Lochman, 2003), even before the conduct problems and aggression are severe enough to warrant a psychiatric diagnosis or lead to legal problems. Second, the most successful interventions for children and adolescents with severe antisocial and aggressive behavior problems have two important characteristics: (1) they tend to be comprehensive by focusing on a number of different risk factors that could lead to the youth's behavioral problems, and (2) they tend to be individualized in that the comprehensive intervention is tailored to the child or adolescent's unique needs (Conduct Problems Prevention Research Group, 2004; Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 1998).

Importantly, knowledge of the characteristics that are specific to youths with CU traits compared to other antisocial and aggressive youth could aid in guiding these

individualized treatments by helping to define the most important targets of intervention for an individual child (McMahon & Frick, 2005). For children without CU traits who largely show reactive aggression, interventions that target their specific information-processing deficits are likely to be important. As noted previously, this group is often hypervigilant to hostile cues and quick to respond to perceived threats. Promoting the use of self-control mechanisms in this group could interrupt an automatic manner of responding and may reduce delinquency in forensic samples (Cauffman, Steinberg, & Piquero, 2005). For example, the Coping Power Program (Lochman, 1992; Lochman & Wells, 2004) specifically focuses on helping the aggressive child to deal with their intense anger, such as controlling their arousal to provocation. It also targets the hostile-attributional biases that often result in reactive aggression. Thus, these programs use common cognitive-behavioral techniques to target the types of information processing deficits that can lead to reactive aggression in youths without CU traits (Boxer & Frick, 2008). The implementation of these treatments typically takes place in small groups of youths, with close supervision of the tasks. Moreover, these programs have been found to be effective even with highly aggressive adolescent offenders (Guerra & Slaby, 1990).

Youths who engage in mixed – instrumental and reactive – types of aggression and who also show high levels of CU traits show different emotional and cognitive characteristics. As noted previously, rather than showing problems regulating emotions, such children often show emotional detachment (e.g., Muñoz, Frick, et al., 2008a). They often view aggression as a means of attaining their goals and solving their problems and they tend to affiliate with other aggressive youth, who share and reinforce these beliefs (Kimonis, Frick, & Barry, 2004; Pellegrini & Bartini, 2001; Poulin & Boivin, 2000; Stickle, et al., 2009). Further, they do not tend to focus on the negative effects of their behavior on others or on the potential of being punished for their aggressive behaviors (Pardini, et al., 2003). All

of these characteristics seem to make this group a particularly challenging group of aggressive youth to treat (Boxer & Frick, 2008).

However, there are several promising findings to suggest that such children and adolescents are not untreatable. First, Hawes and Dadds (2005) reported that clinic-referred boys (ages 4 to 9) with conduct problems and CU traits were less responsive to a parenting intervention than boys with conduct problems who were low on CU traits. However, this differential effectiveness was not consistently found across all phases of the treatment. That is, children with and without CU traits seemed to respond equally well to the first part of the intervention that focused on teaching parents methods of using positive reinforcement to encourage prosocial behavior. In contrast, only the group without CU traits showed added improvement with the second part of the intervention that focused on teaching parents more effective discipline strategies. This outcome would be consistent with the reward-oriented response style that, as reviewed previously, appears to be characteristic of children with CU traits.

Second, Waschbusch, Carrey, Willoughby, King, and Andrade (2007) recruited children (ages 7 to 12) to a summer treatment program for children with attention-deficit and hyperactivity disorder and conduct problems. They reported that children with conduct problems and CU traits responded less well to behavior therapy alone than children with conduct problems without CU traits. However, these differences largely disappeared when stimulant medication was added to the behavior therapy, although the children with CU traits were still less likely to score in the normative range than those without these traits.

Third, although some people have been generally pessimistic regarding the treatment of adolescent offenders with CU traits, there are several examples in which treatment has proven to be successful (see Salekin, Worley, & Grimes, 2010). In one notable example, Caldwell, Skeem, Salekin and Van Rybroek (2006) demonstrated that detained adolescent

offenders high on a measure that included CU traits (i.e., the PCL: YV) who received an intensive treatment lasting 45 weeks and using highly trained team of workers were slower and less likely to recidivate in a 2-year follow-up period compared to offenders high on CU traits in a standard treatment program in the same correctional facility. Caldwell, McCormick, Umstead, and Van Rybroek (2007) also showed that institutional misconduct and aggression had improved in youths high on CU traits with this specialized intensive treatment program.

Thus, research shows intensive treatments can work in institutions for a subgroup of youth with CU traits, irrespective of the observation that current interventions have not specifically been designed to treat youths with CU traits (Salekin, et al., 2010). The intensive treatment program used by Caldwell and colleagues (2006; 2007) included reward-oriented approaches, taught empathy skills, and used approaches that targeted the interests of the adolescent in order to motivate these youths to change their behaviors. These approaches are consistent with recommendations to target the reward-oriented response style of this group instead of relying on interventions that are solely punishment-oriented (Frick, 2006). Therefore, the development of interventions that are focused on changing the cognitions that reinforce aggressive responses or that enhance the recognition and appreciation of distress in victims could be informed by the research on the unique emotional and cognitive characteristics of aggressive adolescents with CU traits.

Implications for understanding aggression in girls

An important extension of this work is whether or not research on the associations among CU traits, aggression and the various emotional and cognitive correlates is similar for boys and girls. In toddlerhood, girls and boys do not typically differ in their use of aggression (see Hay, 2005 for a review). However, by school-age, boys are more aggressive and show more conduct problems than girls (Kim-Cohen, et al., 2005; Offord, Boyle, &

Racine, 1991; Pepler & Craig, 2005). Nevertheless, there is some evidence that girls' aggression may be displayed in different ways from boys (see Björkqvist, Österman, & Kaukiainen, 1992; Crick & Grotpeter, 1995; Crick & Zahn-Waxler, 2003). Specifically, several studies have shown that when girls behave aggressively, they are more likely to choose relational aggression (rather than physical or overt aggression) as a strategy for use within the peer group (Crick & Grotpeter, 1995; Ostrov & Keating, 2004). Relational aggression includes gossiping, social exclusion, rumor spreading, and general harm to relationships, which are all considered as hurtful to girls as physical aggression is to boys (Galen & Underwood, 1997).

Importantly, relational aggression shares some of the same emotional and cognitive risk factors as those reviewed previously as being associated with physical aggression. For example, in a school-aged sample of boys and girls, relational aggression after social provocation was related to heightened emotional reactivity, as measured by systolic blood pressure (Murray-Close & Crick, 2007). In another study, which measured emotional dysregulation by self-report in a juvenile detained sample of girls, poor emotion regulation abilities and anger in response to provocation were related to greater levels of the reactive type of relational aggression (Marsee & Frick, 2007). Further, in this same sample, instrumental relational aggression was uniquely related to CU traits, while controlling for reactive relational aggression. Also, similarly to boys, this relation to instrumental aggression may stem from a lack of anxiety that is associated with CU traits in girls (Hipwell, et al., 2007). Thus, these studies support the utility of separating relational aggression into reactive and instrumental functions of aggression (Marsee & Frick, 2007; Penney & Moretti, 2007). When this is done, the emotional and cognitive correlates that are shown for boys' physical aggression seem to apply to girls' relational aggression. Thus, girls may benefit from similar interventions for aggression that were described above.

Conclusion

In summary, CU traits appear to be related to severe forms of aggression, which include planned and purposeful aggression as well as retaliatory aggression. This severe aggressive pattern that is shown in youths with CU traits may be due to a temperamental deficit in their emotional responses to negative emotional stimuli and their responses to punishment which could influence the normal development of empathy and guilt. By understanding the mechanisms involved in the development of aggression for this important group of youths, it can allow for preventive interventions designed to prevent the expression of this severe pattern of aggressive behavior. Further, it allows interventions to be tailored to the unique needs of this heretofore very difficult to treat group of offenders. Finally, by separating this distinct group of very aggressive youth from other aggressive youth, it could provide a clearer picture of the mechanisms involved in the aggressive behavior of youth without these CU traits. Specifically, this group largely shows reactive aggression and problems regulating their emotions in response to provocation. Again, prevention and intervention tailored to the needs of this group of aggressive youth is likely to be an important component to a comprehensive and individualized approach to treatment of aggressive adolescents within and outside the juvenile justice system.

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Table 1

A Comparison of Psychopathy Measures Used for Adolescents.

Measure	Source	Traits Assessed	Format	Reporter	Number of Items
Psychopathy Checklist, Youth Version (PCL:YV)	Forth et al., 2003	Interpersonal Features, Deficient Affect, Impulsive Lifestyle, and Antisocial Lifestyle	Interview/ Record review	Skilled rater	20 items
Antisocial Process Screening Device (APSD)	Frick & Hare, 2001	Impulsivity, Narcissism, Callous-unemotional Traits	Rating Scale	Parent Teacher Youth	20 items
Child Psychopathy Scale (CPS)	Lynam, 1997	Affective-interpersonal Deficits, Impulsive/antisocial Behavior	Rating Scale	Parent & Youth	41 items
Youth Psychopathic Traits Inventory (YPI)	Andershed et al. 2002	Impulsive/Irresponsible, Grandiose/Manipulative, Callous/Unemotional	Rating Scale	Youth	50 items

Inventory of Callous-	Frick, 2004	Callous, Uncaring, Unemotional	Rating Scale	Parent,	24 items
Unemotional Traits (ICU)				Teacher,	
				Youth	